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T-2377

Job No.: CTCE/BBMP/W.No.08/NV/CSR-09/141h/CEMENT/2016-17 Date: 14.09.2016

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. N. Venkatesh,** #214, 6th Cross, Jakkur Layout, Bangalore – 64.
*NAME OF THE WORK	:	Improvements and Asphalting to roads in Sahakaranagara in Ward No.08, BBMP, Bangalore.
*REFERENCE	:	EE/BTP/BBMP/E-PMT/LOA/T-11/16705/2015-16 Dated: 20.04.2015
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	12.09.2016
PERIOD OF TESTING	:	12.09.2016 to 14.09.2016

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	29.00 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	145 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	480 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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T-2377

Job No.: CTCE/BBMP/W.No08/NV/CSR-09/141h/SAND-Gradation/2016-17 : 14.09.2016

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. N. Venkatesh,**
#214, 6th Cross, Jakkur Layout, Bangalore – 64.

*** Name of Work** : Improvements and Asphalting to roads in Sahakaranagara in Ward No.08, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/LOA/T-11/16705/2015-16 Dated: 20.04.2015

Technical Reference : IS : 2386 Part 1 - 1963 RA-2007

Sample ID : Fine Aggregates

Sample Received on : 12.09.2016

Date of Testing : 14.09.2016

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	96.80	90-100	90-100	90-100	95-100
2.36	77.80	60-95	75-100	85-100	95-100
1.18	56.80	30-70	55-90	75-100	90-100
600 Micron	28.30	15-34	35-59	60-79	80-100
300 Micron	13.80	5-20	8-30	12-40	15-50
150 Micron	5.30	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

Remarks : This sample is under Zone-I specific limits.

AE-B

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Job No.: CTCE/BBMP/W.No.08/NV/WMM/Gradation/2016-17 14.09.2016

GRADATION FOR WMM

Customer : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

Agency : **Mr. N. Venkatesh,**
#214, 6th Cross, Jakkur Layout, Bangalore – 64.

Name of Work : Improvements and Asphalting to roads in Sahakaranagara in Ward No.08, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/LOA/T-11/16705/2015-16 Dated: 20.04.2015

Date of Testing : 14.09.2016

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	120	120	2.4	97.6	95-100
22.4	1525	1645	32.90	67.10	60-80
11.2	1020	2665	53.30	46.70	40-60
4.75	540	3205	64.10	35.90	25-40
2.36	490	3695	73.90	26.10	15-30
0.600	480	4175	83.50	16.50	8-22
0.075	600	4775	95.50	4.50	0-5

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Job No.: CTCE/BBMP/W.No.08/NVR/WMM/AIV/2016-17

14.09.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. N. Venkatesh,** #214, 6th Cross, Jakkur Layout, Bangalore – 64.
Name of the Work	Improvements and Asphalting to roads in Sahakaranagara in Ward No.08, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/LOA/T-11/16705/2015-16 Dated: 20.04.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	14.09.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	385	386	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.08	22.28	22.18

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.08/NV/WMM/S-T/2016-17 14.09.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. N. Venkatesh,** #214, 6th Cross, Jakkur Layout, Bangalore – 64.
Name of Work	Improvements and Asphalting to roads in Sahakaranagara in Ward No.08, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/LOA/T-11/16705/2015-16 Dated: 20.04.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	14.09.2016

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Result : Flakiness Index = **11.32%**

Elongation Index = **13.25%**

Result : Combined Flakiness & Elongation index 24.57%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.08/NV/SDBC/AIV/2016-17 24.09.2016

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. N. Venkatesh,** #214, 6th Cross, Jakkur Layout, Bangalore – 64.
Name of the Work	Improvements and Asphalting to roads in Sahakaranagara in Ward No.08, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/LOA/T-11/16705/2015-16 Dated: 20.04.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	24.09.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	383	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.47	21.67	21.57

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.08/NV/SDBC/Shape_T/2016-17 : 24.09.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. N. Venkatesh,** #214, 6th Cross, Jakkur Layout, Bangalore – 64.
Name of Work	: Improvements and Asphalting to roads in Sahakaranagara in Ward No.08, BBMP, Bangalore.
Reference	: EE/BTP/BBMP/E-PMT/LOA/T-11/16705/2015-16 Dated: 20.04.2015
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 24.09.2016

Result : Flakiness Index = **11.20%**

Elongation Index = **13.25%**

Result : Combined Flakiness & Elongation index **24.45%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.08/NV/SDBC/Stripping/2016-17 24.09.2016

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. N. Venkatesh,** #214, 6th Cross, Jakkur Layout, Bangalore – 64.
Name of the work	Improvements and Asphalting to roads in Sahakaranagara in Ward No.08, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/LOA/T-11/16705/2015-16 Dated: 20.04.2015
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	24.09.2016

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.08/NV/SDBC/Sp_Wa/2016-17

24.09.2016

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. N. Venkatesh,** #214, 6th Cross, Jakkur Layout, Bangalore – 64.
Name of the Work	Improvements and Asphalting to roads in Sahakaranagara in Ward No.08, BBMP, Bangalore
Reference	EE/BTP/BBMP/E-PMT/LOA/T-11/16705/2015-16 Dated: 20.04.2015
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	24.09.2016

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2015	2016	2017	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1260	1261	1262	
4	Weight of saturated surface dry aggregate in air	W_3 g	2020	2021	2022	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	760	760	760	
6	Weight of oven dried aggregate	W_4 g	2010	2011	2006	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.645	2.646	2.639	2.643
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.680	2.681	2.696	2.686
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.50%	0.50%	0.80%	0.60%

A.E.E.

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/W.No.08/NV/SDBC/Bitumen/2016-17 24.09.2016

BITUMEN CONTENT AND GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP,
AGENCY	**Mr. N. Venkatesh,** #214, 6th Cross, Jakkur Layout, Bangalore – 64.
NAME OF THE WORK	Improvements and Asphalting to roads in Sahakaranagara in Ward No.08, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP/E-PMT/LOA/T-11/16705/2015-16 Dated: 20.04.2015
SAMPLE I/D	Roads in Sahakaranagara in Ward No.08
DATE OF TESTING	24.09.2016

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475.5	473.5
3. Weight of Asphalt and Mineral matter Extracted,	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	24.5	26.50
7. Bitumen content in %	4.90	5.30
8. Average	**5.10**	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	36.32	7.64	7.64	92.36	90-100
4.75	258.9	54.45	62.09	37.91	35-51
2.36	36.36	7.65	69.73	30.27	24-39
1.18	42.32	8.90	78.63	21.37	15-30
0.3	43.25	9.10	87.73	12.27	9-19
0.075	30.25	6.36	94.09	5.91	3-8

SIEVE SIZE	Trail 2				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	32.26	6.45	6.45	93.55	90-100
4.75	265.3	53.06	59.51	40.49	35-51
2.36	61.32	12.26	71.78	28.22	24-39
1.18	53.15	10.63	82.41	17.59	15-30
0.3	40.25	8.05	90.46	9.54	9-19
0.075	31.22	6.24	96.70	3.30	3-8

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